

Title: Epidemiology and Linking of Oral/Facial Clefts and Environmental Hazards, Oklahoma, 1994-2002

Keywords: Oral/facial clefts, health effects, environmental hazards, epidemiology, linking, mapping

Background: Both genetic and environmental factors, or interactions between genes and the environment have been linked to oral/facial clefts. Birth control/hormonal medications, maternal diabetes, maternal alcohol/tobacco lifestyle, glycol ethers, pesticides, dioxins, solvents, chlorinated products, and heavy metals have been associated with oral/facial clefts. Approximately one in every 700-1000 newborns is diagnosed with oral/facial clefts.

Objective: To determine relationships between oral/facial clefts and environmental hazards.

Methods: Data for this project was gathered for the Oklahoma Public Health Environmental Tracking System (OK-PHETS), a joint project between the Oklahoma State Department of Health (OSDH) and the Oklahoma Department of Environmental Quality (DEQ). Denominator data was obtained from OSDH Vital Records. Oral/facial cleft data from OSDH-Birth Defects Registry, and environmental hazards data from DEQ were compiled, mapped, and statistically analyzed. SatScan's spatial cluster analysis, binomial confidence interval testing/Chi-Square test, and multiple regression analysis were conducted at both county and zipcode levels to determine relationships between oral/facial clefts and selected environmental chemicals from DEQ data.

Results: As in previous studies, oral/facial clefts were more frequent in Caucasians than in African Americans. Oral/facial clefts were more frequent among infants of mothers with tobacco or alcohol use during pregnancy. Visual and SaTScan statistical analyses of county and zip rates showed potential clustering of cases in Southeast (SE) Oklahoma. Regression analysis on county and zipcode oral cleft rates using specific chemicals from DEQ's Air Emission, or Toxic Release Inventory sites revealed no significant relationships between oral/facial clefts and environmental hazards studied.

Conclusions: Oral/facial cleft occurrences seemed to cluster in SE Oklahoma. Maternal alcohol and tobacco use during pregnancy increased the risk of oral/facial cleft rates.

Evaluation: In addition to county and zipcode level, case level analyses should be done. Spatial and statistical analyses also need to be fine tuned to control for genetic factors. Water quality data needs to be included in future analysis.

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